

What we claim is:

1. A hybrid electric vehicle power generation system, comprising:

a turbogenerator/motor;

a DC bus;

a first power converter connecting said turbogenerator/motor and said DC bus, said first power converter serving as a AC to DC converter when power is supplied from said turbogenerator/motor to said DC bus and as an DC to AC converter when power is supplied from said DC bus to said turbogenerator/motor during start up and operation of said turbogenerator/motor;

a hybrid electric vehicle energy storage device;

a second power converter connecting said hybrid electric vehicle energy storage device and said DC bus, said second power converter transferring power between said DC bus and said hybrid electric vehicle energy storage device;

said first and said second power converters together serving as a power controller to provide a distributed generation power system to regulate said DC bus to a desired voltage independent of turbogenerator/motor speed.

2. The turbogenerator/motor control system of claim 1 wherein said turbogenerator/motor is a permanent magnet turbogenerator/motor.

3. The turbogenerator/motor control system of claim 1 and in addition, a resistive load connected across said DC bus to dissipate power from said DC bus whenever said DC bus exceeds the desired voltage.

5 4. The turbogenerator/motor control system of claim 1 wherein said hybrid electric
vehicle energy storage device is a battery

6 5. The turbogenerator/motor control system of claim 1 wherein said hybrid electric
7 vehicle energy storage device is a flywheel.

8 6. The turbogenerator/motor control system of claim 1 wherein said hybrid electric
9 vehicle energy storage device is an ultracapacitor.

1 7. The turbogenerator/motor control system of claim 4 wherein said power controller
2 includes means to detect transients associated with said turbogenerator/motor and said hybrid
3 electric vehicle battery.

4 8. A hybrid electric vehicle power generation system, comprising:
5 a DC bus;
6 a permanent magnet turbogenerator/motor;
7 a hybrid electric vehicle battery;
8 a power controller to provide a distributed generation power system to regulate said DC
9 bus to a desired voltage independent of permanent magnet turbogenerator/motor speed, said
10 power controller having
11 a first power converter connecting said permanent magnet turbogenerator/motor and said DC bus
12 serving as a AC to DC converter when power is supplied from permanent magnet
13 turbogenerator/motor to said DC bus and as a DC to AC converter when power is supplied from
14 said DC bus to said permanent magnet turbogenerator/motor during start up and operation of said
permanent magnet turbogenerator/motor, a second power converter connecting said hybrid
electric vehicle battery and said DC bus serving as a DC to DC converter when power is supplied
from said DC bus to said hybrid electric vehicle battery and as a reverse DC to DC converter

15 when power is supplied from said hybrid electric vehicle battery to said DC bus, and means to
16 detect transients associated with any of said permanent magnet turbogenerator/motor and said
17 hybrid electric vehicle battery; and
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19 a resistive load connected across said DC bus to dissipate power from said DC bus
whenever said DC bus exceeds the desired voltage.

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